

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number
WO 2005/080628 A2

- (51) International Patent Classification⁷: **C23C 16/34**, 16/30
- (74) Agents: **VESIN, Jacques et al.**; c/o L'AIR LIQUIDES S.A., Direction de la Propriété Intellectuelle, 75, quai d'Orsay, F-75321 Paris Cedex 07 (FR).
- (21) International Application Number: **PCT/IB2005/000170**
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 19 January 2005 (19.01.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
2004-025479 2 February 2004 (02.02.2004) JP
- (71) Applicant (for all designated States except US): **L'AIR LIQUIDE, SOCIÉTÉ ANONYME À DIRECTOIRE ET CONSEIL DE SURVEILLANCE POUR L'ÉTUDE ET L'EXPLOITATION DES PROCÉDÉS GEORGES CLAUDE** [FR/FR]; 75, quai d'Orsay, F-75321 Paris Cedex 07 (FR).
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **TSUKUDA, Eri** [JP/JP]; Amour Liberte 18, 306, 2-13-3 Matsushiro, Tsukuba, Ibaraki 305-0035 (JP). **DUSSARRAT, Christian** [FR/JP]; Tsukuba-Matsushiro 4-2-1 #204, 4-15-2, Matsushiro, Tsukuba-shi, Ibaraki 305-0035 (JP). **GIRARD, Jean-Marc** [FR/FR]; 12, rue Michel Chasles, F-75012 Paris (FR).
- Published:
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **METHOD FOR PRODUCING SILICON NITRIDE FILMS AND SILICON OXYNITRIDE FILMS BY CHEMICAL VAPOR DEPOSITION**

(57) Abstract: To provide a CVD-based method for the relatively low temperature production of silicon nitride films and silicon oxynitride films that exhibit excellent film properties wherein said method is not accompanied by the production of ammonium chloride. Gaseous aminosilane such as tris(isopropylamino)silane and a gaseous hydrazine compound such as dimethylhydrazine are fed into a chemical vapor deposition reaction chamber that holds at least one substrate and silicon nitride film is formed on the substrate by reacting the two gases in said chemical vapor deposition reaction chamber.

WO 2005/080628 A2